

Claims:

1. A process for producing a synthetic middle distillate having a Cetane number higher than 70, the process including:
 - 5 (a) separating the products obtained from synthesis gas via a FT synthesis reaction into one or more heavier fraction and one or more lighter fraction;
 - (b) catalytically processing the heavier fraction under conditions which yield mainly middle distillates;
 - (c) separating the middle distillate product of step (b) from a light product fraction and a heavier product fraction which are also produced in step (b); and
 - 10 (d) blending the middle distillate fraction obtained in step (c) with at least a portion of the one or more lighter fraction of step (a), or products thereof.
2. A process for producing a synthetic middle distillate as claimed in claim 1, wherein the catalytic processing of step (b) is a hydroprocessing step.
- 15 3. A process for producing a synthetic middle distillate as claimed in claim 2, wherein the catalytic processing of step (b) is a hydrocracking step.
4. A process for producing a synthetic middle distillate as claimed in claim 1, including one or more additional step of fractionating at least some of the one or more lighter fraction of step (a), or products thereof, prior to step (d).
- 20 5. A process for producing a synthetic middle distillate as claimed in claim 1, including the additional step of hydrotreating at least some of the one or more light fraction of step (a), or products thereof, prior to step (d).
6. A process for producing a synthetic middle distillate as claimed in claim 3, including the additional step of hydrotreating at least some of the one or more light fraction of step (a), or products thereof,
- 25 prior to step (d).
7. A process for producing a synthetic middle distillate as claimed in claim 1, wherein the one or more heavier fraction of step (a) boils above about 270°C.
8. A process for producing a synthetic middle distillate as claimed in claim 3, wherein the one or more heavier fraction of step (a) boils above about 270°C.
- 30 9. A process for producing a synthetic middle distillate as claimed in 7, wherein the one or more heavier fraction of step (b) has a isoparaffins to n-paraffins mass ratio of between 4:1 and 14:1.
10. A process for producing a synthetic middle distillate as claimed in 8, wherein the one or more heavier fraction of step (b) has a isoparaffins to n-paraffins mass ratio of 21:2.
11. A process for producing a synthetic middle distillate as claimed in claim 1, wherein the one or more heavier fraction of step (a) boils above about 300°C.
- 35 12. A process for producing a synthetic middle distillate as claimed in claim 1, wherein the one or more lighter fraction boils in the range C₅ to the boiling point of the heavier fraction.

13. A process for producing a synthetic middle distillate as claimed in claim 12, wherein the one or more lighter fraction boils in the range 160°C to 270°C.
14. A process for producing a synthetic middle distillate as claimed in claim 12, wherein the one or more lighter fraction has an isoparaffins to n-paraffins mass ratio of between 1:2 and 4:1.
- 5 15. A process for producing a synthetic middle distillate as claimed in claim 14, wherein the one or more lighter fraction has an isoparaffins to n-paraffins mass ratio of 2.2:1.
16. A process for producing a synthetic middle distillate as claimed in claim 1, wherein the product of step (d) boils in the range 100°C to 400°C.
17. A process for producing a synthetic middle distillate as claimed in claim 1, wherein the product of
10 step (d) boils in the range 160°C to 370°C.
18. A process for producing a synthetic middle distillate as claimed in claim 1, wherein the product of step (d) is a diesel fuel which has a CFPP below -20°C.
19. A process for producing a synthetic middle distillate as claimed in claim 18, wherein the product of
15 step (d) is obtained by mixing the middle distillate fraction obtained in step (c) with at least a portion of the one or more lighter fraction of step (a), or products thereof, in a volume ratio selected to provide a diesel fuel having a required specification.
20. A process for producing a synthetic middle distillate as claimed in claim 19, wherein the product of
20 step (d) is obtained by mixing the middle distillate fraction obtained in step (c) with at least a portion of the one or more lighter fraction of step (a), or products thereof, in a volume ratio of between 1:1 and 9:1.
21. A process for producing a synthetic middle distillate as claimed in claim 20, wherein the product of
25 step (d) is obtained by mixing the middle distillate fraction obtained in step (c) with at least a portion of the one or more lighter fraction of step (a), or products thereof, in a volume ratio of between 2:1 and 6:1.
22. A process for producing a synthetic middle distillate as claimed in claim 19, wherein the product of
step (d) is obtained by mixing the middle distillate fraction obtained in step (c) with at least a portion of the one or more lighter fraction of step (a), or products thereof, in a volume ratio of 84:16.